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WE CLAIM:

1           1.   A high aperture color liquid crystal display  
2   including color filters, the display comprising:  
3               first and second substrates;  
4               a liquid crystal layer sandwiched between said  
5   first and second substrates;  
6               first and second different colored pixels, said  
7   first pixel including on said first substrate a first  
8   pixel electrode, a first insulating color filter, and a  
9   first thin-film transistor (TFT), and said second pixel  
10   including on said first substrate a second pixel  
11   electrode, a second insulating color filter, and a second  
12   TFT, wherein said first and second color filters are  
13   differently colored;  
14               said first and second pixel electrodes  
15   overlapping corresponding address lines in communication  
16   with respective TFTs so as to define a high aperture  
17   display, said overlapping forming areas of overlap;  
18               said first insulating color filter being at  
19   least partially disposed in an area of overlap in said  
20   first pixel between said first pixel electrode and an  
21   address line, said first color filter having a dielectric

22 constant of less than about 5.0 and having a first  
23 contact hole defined therein that allows said first pixel  
24 electrode to be electrically connected to said first TFT;  
25 and

26           said second insulating color filter being at  
27 least partially disposed in an area of overlap in said  
28 second pixel between said second pixel electrode and an  
29 address line, said second color filter having a  
30 dielectric constant less than about 5.0 and having a  
31 second contact hole defined therein that allows said  
32 second pixel electrode to be electrically connected to  
33 said second TFT.

1           2.    The LCD of claim 1, wherein said pixel  
2 electrodes are conductive, and are of a thickness of from  
3 about 300 Å - 900 Å in order to reduce interface stress  
4 between the pixel electrodes and the color filters.

1           3.    The LCD of claim 1, wherein said color filters  
2 are each formed of a negative resist.

1           4.    The LCD of claim 1, wherein each of said color  
2 filters has a refractive index of from about 1.5 to 2.0.

1           5.    The LCD of claim 1, wherein the dielectric  
2 constant  $\epsilon$  of each of said color filters is less than  
3 about 4.0.

1           6.    The LCD of claim 1, wherein each of said color  
2 filters is of a photo-imageable material.

1           7.    The LCD of claim 1, wherein each of said  
2 filters is from about 1.5 - 2.5  $\mu\text{m}$  thick, and wherein  
3 said first pixel electrode overlaps a first one of said  
4 address lines, said second pixel electrode overlaps a  
5 second one of said address lines.

1           8.    The LCD of claim 1, wherein said color filters  
2 overlap said address lines to a greater extent than do  
3 corresponding pixel electrodes.

1           9.    The LCD of claim 1, wherein the pixel aperture  
2 ratio of the LCD is at least about 68% and wherein each

3 of said color filters is patterned into an elongated  
4 strip covering a plurality of pixels across the viewing  
5 area of the display.

1 10. The LCD of claim 1, wherein the areas of  
2 overlap are filled with color filters, and the overlap  
3 areas have a width across the address lines of from about  
4 0.1 to 2.0  $\mu\text{m}$  in the overlap areas and the filters are of  
5 a material and thickness so that the address line-pixel  
6 capacitance is from about 4.5 to 10 fF.

1 11. The LCD of claim 10, wherein the capacitance is  
2 less than about 7.0 fF.

1 12. A pixel having a photo-imageable color filter  
2 in a liquid crystal display, the pixel comprising:

3 first and second substrates;

4 a liquid crystal layer sandwiched between said

5 first and second substrates;

6 a thin film transistor (TFT) provided on said

7 first substrate including a gate electrode, a drain

8 electrode, and a source electrode;

9           a first address line provided on said first  
10 substrate, said first address line in communication with  
11 said gate electrode;

12           a second address line provided on said first  
13 substrate, said second address line in communication with  
14 said drain electrode;

15           a pixel electrode provided on said first  
16 substrate, said pixel electrode overlapping at least a  
17 portion of said TFT and overlapping at least a portion of  
18 one of said address lines so as to define areas of  
19 overlap;

20           a color filter insulating layer provided on  
21 said first substrate in said areas of overlap, said color  
22 filter insulating layer having a dielectric constant  $\epsilon$   
23 less than about 5.0 and a thickness of at least about 1.0  
24  $\mu\text{m}$  in said areas of overlap;

25           wherein said color filter includes a contact  
26 hole defined therein proximate said source electrode so  
27 that said pixel electrode electrically communicates with  
28 said source electrode through said contact hole; and

29                wherein said color filter overlaps said address  
30 line(s) to a greater extent than does said pixel  
31 electrode.

1            13. The pixel of claim 12, wherein said color  
2 filter is one of a red, green, and blue color filter, and  
3 wherein said color filter has a dielectric constant of  
4 less than or equal to about 4.0, and wherein said areas  
5 of overlap have a width of at least about 0.5  $\mu\text{m}$ .

1            14. The pixel of claim 12, wherein said color  
2 filter is a resist, and includes a color pigment or dye,  
3 and a thickness of from about 1.5 to 2.5  $\mu\text{m}$  in said areas  
4 of overlap.

1            15. The pixel of claim 12, wherein said color  
2 filter is of a material and thickness such that a liquid  
3 crystal display including a plurality of such color  
4 filters can exhibit a white light contrast ratio of at  
5 least about 10:1 over a horizontal angular span, at a  
6 predetermined vertical angle, of at least about 120° and  
7 over a vertical angular span of greater than about 50° at

8 a predetermined horizontal angle when predetermined  
9 retarders are provided in the display.

1 16. The pixel of claim 12, wherein said color  
2 filter and said pixel electrodes each overlap at least a  
3 portion of said first and second address lines, and  
4 wherein said color filter overlaps each of said address  
5 lines to a greater degree than does said pixel electrode.

1 17. The pixel of claim 16, wherein said color  
2 filter is of a material and thickness so that in one of  
3 said address line areas of overlap, the line-pixel  
4 capacitance is from about 4.5 to 10.0 fF when the length  
5 of said one area is a reference of about 100  $\mu\text{m}$ .

1 18. The pixel of claim 12, wherein the pixel  
2 electrode has a thickness of from about 300Å - 900Å.

1 19. A method of making a color liquid crystal  
2 display having strips of insulating color filters, the  
3 method comprising the steps of:

4 providing first and second substrates;



5           providing a liquid crystal material;  
6           forming an array of isolation switching  
7 elements on said first substrate and a plurality of  
8 address lines in communication with said isolation  
9 switching elements;  
10          depositing a first resist color filter layer on  
11 said first substrate over top of said address lines and  
12 said switching elements;  
13          photo-imaging said first resist color filter  
14 layer so as to pattern it into a first array of elongated  
15 strips on said first substrate so that color filters in  
16 said first array are of a first color and overlap at  
17 least a portion of at least two address lines;  
18          depositing a second resist color filter layer  
19 of a second color over top of said first array of color  
20 filters;  
21          photo-imaging said second resist color filter  
22 layer so as to pattern it into a second array of  
23 elongated strips so that color filters in said second  
24 array overlap at least a portion of at least two address  
25 lines;

26                depositing a third resist color filter layer of  
27 a third color over top of said first and second arrays of  
28 color filters;

29                photo-imaging said third resist color filter  
30 layer so as to pattern it into a third of elongated  
31 strips array so that color filters in said third array  
32 overlap at least a portion of at least two address lines;

33                forming contact holes in color filters in each  
34 of said first, second, and third arrays;

35                depositing a conductive pixel electrode layer  
36 over top of said first, second, and third arrays of color  
37 filters; and

38                patterning said electrode layer so as to form  
39 an array of pixel electrodes wherein pixel electrodes in  
40 said array overlap address lines which are also  
41 overlapped by color filters so that said color filters  
42 act as insulators between said pixel electrodes and  
43 address lines in areas of overlap, and wherein each of  
44 said pixel electrodes is in electrical communication with  
45 a corresponding switching element through one of said  
46 contact holes, and wherein each of said color filters has

47 a greater surface area than do corresponding pixel  
48 electrodes.

1        20. The method of claim 19, wherein said method  
2 steps are performed in the order in which they are  
3 recited, and each of said color filters has a dielectric  
4 constant of less than or equal to about 4.0.